DOCUMENT RESUME

ED 316 326 PS 018 614

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TITLE Using Clay To Help Children Develop Cognitive and Affective Skills for Learning.
PUB DATE Jul 89
NOTE 8p.; Paper presented at the Meeting on Childhood in the 21st Century (Hong Kong, July 31-August 4, 1989).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Affective Behavior; *Art Activities; Art Education; Cognitive Ability; Curriculum Enrichment; Early Childhood Education; High Risk Students; Kindergarten; Language Acquisition; *Manipulative Materials; Preschool Education; *Student Improvement; *Teaching Methods
IDENTIFIERS Affective Domain; *Clays; Cognitive Domain; Psychomotor Domain

ABSTRACT

This study sought to find a way to help children from educationally disadvantaged families to improve their cognitive and language abilities and thus improve their achievement in school. Specifically the study investigated the effectiveness of guided experiences with clay in promoting cognitive, affective, and language growth of educationally disadvantaged children in Columbus, Ohio schools. A total of 39 prekindergarten and kindergarten teachers were trained to teach with clay. Another 14 teachers served as controls. Teachers in the training condition were divided into groups to receive training in three teaching methods. An encouragement method, which focused on the affective domain, addressed the student's self and provided sensory feedback. An observation and discussion method, which focused on affective and cognitive domains, gave students a concept to model, addressed the self, provided sensory feedback, and helped children check perceptions against reality. A technique method, which addressed affective, cognitive, and psychomotor domains, taught children basic techniques of working with clay. A total of 326 children were randomly selected from the 53 classrooms and were tested on the effects of working with clay and of the three methods. Children were given clay to work with for 30 minutes twice a week for 16 weeks. All methods produced more cognitive, affective, and language growth in treatment groups than among controls. Children's growth increased as the number of domains addressed by intervention increased. Teachers can be trained to use the methods effectively. (RH)

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USING CLAY TO HELP CHILDREN DEVELOP COGNITIVE AND AFFECTIVE SKILLS FOR LEARNING

In this paper I will tell you about a research study which was done in Israel and in the United States to find a way to help children from educationally disadvantaged families to improve their cognitive and language abilities and thus improve their achievement in school. In many countries of the world, children have to get their schooling in a second language. One of the great challenges of the 21st. century for people of the world is building social and intellectual bridges as they move from their familiar language, culture and technology to the new and unknown. Dr. Sara Smilansky faced this dilemma in the early years of the restored nation of Israel when people from all over the world came to live there. The tiny country became like a world laboratory for such an educational problem. How can children from such diverse cultures, values and languages learn together?

Dr. Smilansky noticed that some children adjusted better than others. She studied their homes to see how their home experiences were similar and different. In some ethnic groups, she found very little imaginative play, little use of drawing or writing in the home---two things which researchers have found to be related to school success. She introduced play and drawing into the kindergartens and found that the children's cognitive and language abilities improved. Follow-up studies in the United States confirmed the advantage of introducing sociodramatic play and drawing in the curriculum for inner-city disadvantaged children.

Dr. Smilansky then decided to try using a three-dimensional material for children to express their ideas. She provided clay---that material which many teachers avoid because it is "messy." After experimenting with the clay in Israeli kindergartens, we tried it in Columbus, Ohio in schools which were considered priority schools because so many children in them were at risk.

Thirty-nine prekindergarten and kindergarten teachers were chosen to be trained to teach with clay. Another fourteen were designated as a control group. The 39 teachers were divided into three groups, each group being trained to use a different method of teaching with clay. Children from the 53 classrooms were selected randomly to be tested in order to determine the effects of working with clay and the effects of each of the three methods on the children's clay, drawing and cognitive abilities.

Why would we use clay? Clay being a flexible, manipulative three-dimensional medium allows the child to express his ideas and perceptions in the non-threatening clay even though he may not be able to express them in language. This is a place where

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the chidlren can "learn from the inside out." Their interaction with the teacher and other children can put that expression into language and extend and enhance the ideas even further.

Young children's perspective is different from adults. Children have no historical data. They know only the HERE and NOW. The young child in any given situation does not know that everyone in the world does not experience life as he does and know what and whom he knows. The young child sees from the inside looking out *ONLY*. He sees the world only as he touches it or as it touches him. He has no benefit of history. He must build his history through experience and until he has done that, he cannot understand other events, other people's point of view, or the relationship of present events to the past or to predicting the future.

Thinking through the position of the child in time in this way has helped me to understand more fully what Piaget meant by the egocentricity of the young child. He cannot be otherwise because he has no "aerial view", no pre-drawn map, no hindsight or historical perspective to provide comparison for the present experience. His knowledge and ability to deal with ideas, non-visible objects, relationships and concepts depend on accumulated experience and the perceived relationships among those experiences change. The goal of the child is to discover meaning in his universe and his own place in it. This search, incidently, continues throughout life. Teachers must learn about this order of development by looking into their own conceptual development and its ongoing nature.

My point here is that in the 21st century, children will have no more sense of history than they ever have had and will need to build a background of experience the same as all other children in the world have done. They will have to learn from the inside out just as all their ancestors have done. They must be given this right of time to learn in their way about the world into which they are born. They will learn best by exploring it in their own way through playing with it, role-playing it, and recreating it in their scribbles, drawing, sculpturing, painting, and building.

The late Dr. Ross Mooney, professor emeritus at Ohio State University, verbalized for us a theoretical framework for understanding the child's process of producing a figure from clay. I give you this process here, because it helped me to understand better the methodologies we used and the outcome of our research. If we consider a task or systems analysis of what sculpturing-clay-objects requires of the child, we can see more clearly the potential areas in which a teacher might intervene in a child's clay activities to improve his development.

When a child is asked to make the form of an object (e.g. a person or a dog) out of clay, he is being asked to perform a sequence of operations that begins with a concept of the object in his mind and ends with an object formed in clay whose form is

fitted by the child to the concept of that object in his mind. Between the beginning and the end of this sequential event, action moves through a number of distinguishable orderings. To model an object out of clay, a child has to

order the concept

order the self

order his hands

order the clay

order the shape

order the sensory feedback

order the percept

For these orderings to take place, a series of systems is required, each system being a structure that functions within parameters "characteristic of it."

the system of conception

the system of self

the system of body action through the hands

the system of clay

the system of object-shape

the system of sensation

the system of perception, fitting percept to concept (Mooney, 1974)

Assuming that every child has to proceed through all of these processes or systems in making an object from clay, at what points in this sequence of events is adult intervention most helpful in developing children's skills of clay sculpturing and in turn their other cognitive and verbal skills?

Mooney talked about this as the teacher "accompanying the child" in learning and he used an infinity symbol to illustrate it. It is a never-ending process with the child-initiating, the teacher accompanying the child from where he is, introducing new aspects and experiences and following the child back to his own relatedness.

In the clay research project in the United States, the three methods identified and taught to teachers were named, "Encouragement," " Observation/Discussion," and "Technique." As I describe

each method we can see how it related to the child's clay processing.

In the Encouragement Method, the teacher provided the children with clay for thirty minutes two times each week. She gave no required topics and no techniques for working with the clay except for keeping it in good condition. The children made whatever they wanted to and the teacher just talked with them about their activity and products. She entered the system of

Self: She gave the child confidence in his own ability to to represent whatever concept he chose, reinforcing his attempts, and encouraging him toward self-actualization.

Sensory Feedback: As the child worked, the teacher encouraged him to talk about his clay product, and the teacher also verbalized "sensory feedback" by naming for the child what he was doing (e.g. "You are really pounding the clay. You are making that pancake very thin." The child was encouraged to verbalize his sensory experiences himself.

In the Observation/Discussion method, the teacher provided the clay for thirty minutes twice each week, but she also introduced a topic each week, gave children experiences with that idea and then interacted with the children as they worked with the clay, stimulating them to look again, think about what the "dog" has, what else might it need, etc. She intervened in the following systems of the sculpturing process:

Concept: She introduced a subject and provided a variety of experiences in which the child could develop his concept of it.

Self: She then encouraged each child with an "I know you can do it," reinforcing his efforts to represent the concept without intervening in the how-to-do-it

Sensory Feedback: She discussed with the child his clay object, encouraging him to look again, compare, ask what is missing, and what else does it need.

Percept: She helped the child check his perception as revealed in his product with the real; asked questions such as "If I call your doggy can he hear me?" (The clay dog has no ears) or "Tell me about your dog---what does he have?"

In the Technique Method, the teacher did all of the above plus teaching the children some basic techniques of working with clay. Thus we see that in this method the teachers intervened in every system in the clay process.

Concept: She introduced the subject and provided experiences.

Self: She reinforced the child in his effort

Hands: She demonstrated how to use the hands effectively (e.g. how to roll the clay into a ball and to use the thumb and fingers to shape the ball into a pinch pot; or how to use the fingers to join the clay pieces so they wouldn't fall apart.)

Clay: She demonstrated how to use the characteristics of the clay to make it stick together, to make three-dimensional objects versus flat.

Shape: She demonstrated and helped the child find alternatives in ordering the shape of the clay, (e.g. from whole to parts and from parts to whole).

Sensory Feedback: As in the Observation/Discussion Method, she discussed with the child his work with the additional emphasis on the workability of the clay and techniques.

Percept: As in the Observation/Discussion Method, she discussed with the child his product, and if he was not able to make it match his concept, she intervened with technical assistance, showing him a way to make the clay do what he wanted.

We may note here the cumulative effect of the design of these teaching methods. The Encouragement method is basically an intervention in the affective domain. The Observation/Discussion method is basically an intervention in the affective and cognitive domains. The Technique method includes intervention in the affective, cognitive, and psychomotor domains. Thus, each program adds a support system for another domain or dimension of learning and knowing. We may ask how many and which of these support systems are necessary to the most effective teaching - learning through an art medium. If we intervene in the child's process to improve his cognitive abilities, will this have a negative effect on the development of his aesthetic abilities? If a child improves his representational abilities with clay, how will this affect his abilities in other media? In other words, is this learning transferable---if not, we have only made better potters.

These were among the questions we asked of our research data gathered from the three hundred twenty-six children randomly selected to be tested before and after the teachers taught the thirty-two sessions with clay over a period of sixteen weeks. These children represented the sixteen hundred children who had

been taught with clay in those 39 classrooms, and the 14 control classes.

The statistics show that all the clay methods produced more cognitive, affective and language growth in children in the experimental classes than in the control classes. They also show that the more systems supported by the teacher, the more progress the children made. The Technique Method produced the greatest percentage of increase on cognitive, affective and language scales. With myriads of data and statistics all of which are documented in the official report and available in the ERIC system, and in the book Clay in the Classroom. I am simplifying this report within the limits of time.

Beyond the statistical findings, we learned that teachers can be trained to use these methods effectively. We learned that children can learn through an art form which is a natural medium of childhood. They do transfer their learning of a concept to othr media such as drawing and language. They do transfer their learning gained in developing one concept to other concepts within the same and different media. A teacher can watch concept development as children represent them in art media versus having to depend on the child's ability to verbalize his thoughts and understandings. For example we watched a four year old's concept of a bowl change from a piece of flat clay to a container with sides and a bottom which could hold "more." Another four transferred the idea of "smooth" from the underside of his pounded clay to the chalkboard and other objects in the room as he went about touching various surfaces and repeating wonderingly, "It's smooth, it's smooth."

We found that clay is a natural and effective medium for little boys. We found that children who have been unsuccessful in learning through conventional classroom methods of language expression, could "speak through the clay", and often could then put into language what they had said in the clay.

Clay is only the *medium* of expression. It makes no demands on the child. The child brings his world to it and through it the teacher can behold the child. It's success as with any teaching method depends on the nurturing role the teachers play during this aesthetic experience. Meaningful dialogue is enabled when teachers are sensitive and involved because of personal experience and remembering, and are knowledgeable because of an understanding in the production and appreciation of a work of art. This must be coupled with an awareness of the child's world and early beginnings. (Kantner, 1989)

In the 21st. century, children will come into the world with nothing but the here and now, just as all people have. They will need to figure out, construct their knowledge of the themselves and their environment just as all be people have. They will have to learn it from the inside out. We must guarantee them time to do that. We must not so completely consume their time with adult conceived and directed activity that they do not have time to

explore, to stare, to experiment, to observe and to make things. One of my favorite research studies was done by Birch in 1945, and reported by Hunt in his book, Intelligence and Experience. Birch tried to teach four and five year old Chimpanzees to use a "hoe" made of sticks as a tool to get food down from the top of the cage. Only one Chimp was successful. He was the one that had been seen at a younger age playing in a similar manner with a stick. Montessori believed in sensitive periods for learning. Teachers need to be sensitive to those sensitive times when children are ready to learn important things in their lives. Kantner (1989) suggests that as teachers encourage children to continue to feel, touch, hear, and see their world as part of themselves, "this provides the motiviation and often suggests the appropriate activity and readiness level established by early environmental and aesthetic beginnings.

There probably are no real short-cuts to child development. The best approach would seem to be to join the child at his stage of development, teach him through his own preferred and child-like media, expanding his world patiently as we accompany him in his play and learning. He will probably construct a more realistic view and theory of his world than the one we take from a box to give him. He will know that he knows and learn how to learn, the greatest gift we can give children of the 21st century.

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This paper was presented at the International Conference on Early Education and Development (0-6): Childhood in the 21st. Century, Hong Kong, August 3, 1989.